

903-3

Wood Pres. Co.



CREOSOTED PINE PRODUCTS

ROCK INSTITUTE
PHILADELPHIA

Geophins

REPRODUCED FROM THE
ORIGINAL MANUSCRIPT

[BLANK PAGE]



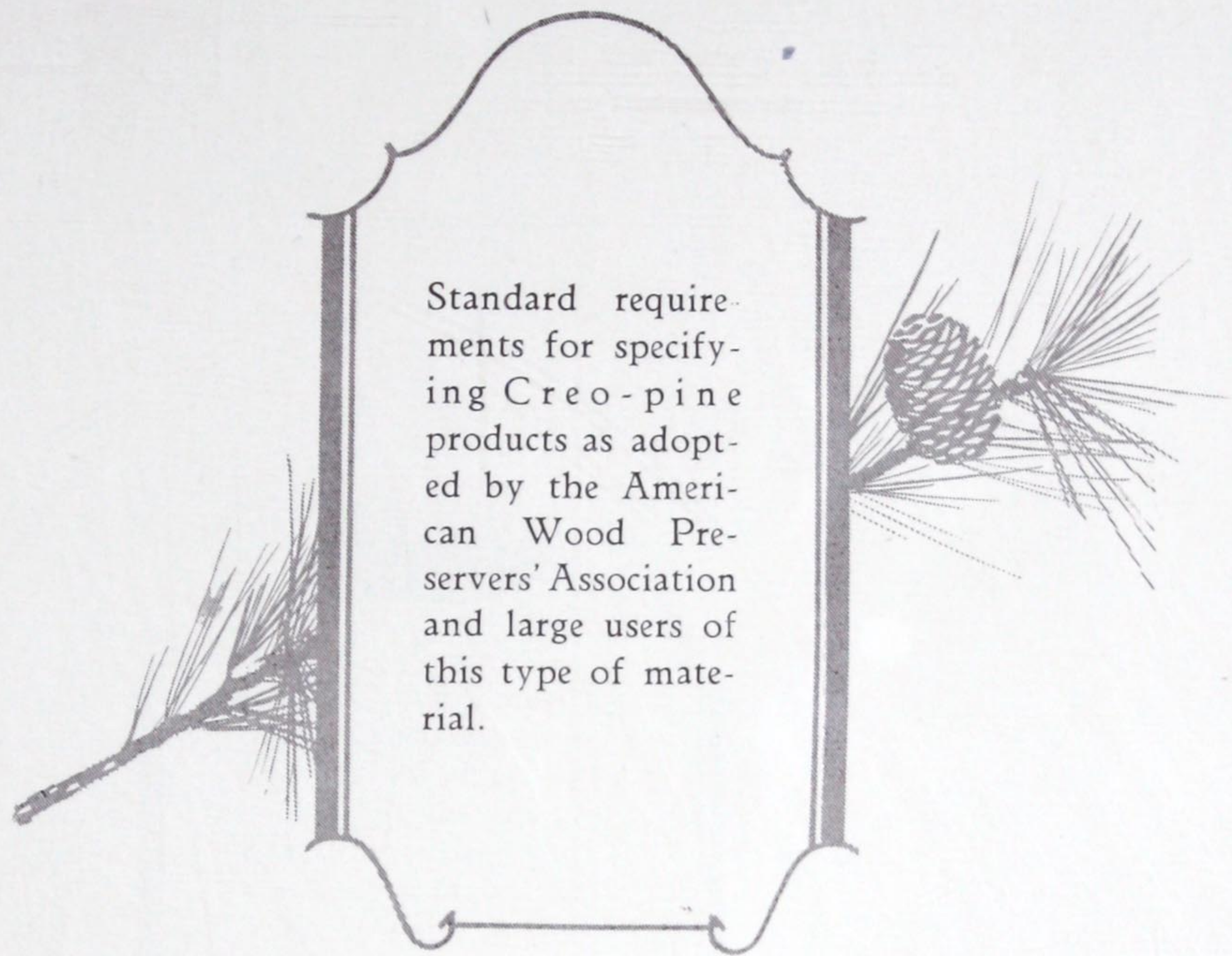
CCA

A decorative frame with a scalloped top and bottom, and vertical bars on the sides. Pine branches with needles and cones are illustrated on the left and right sides of the frame.

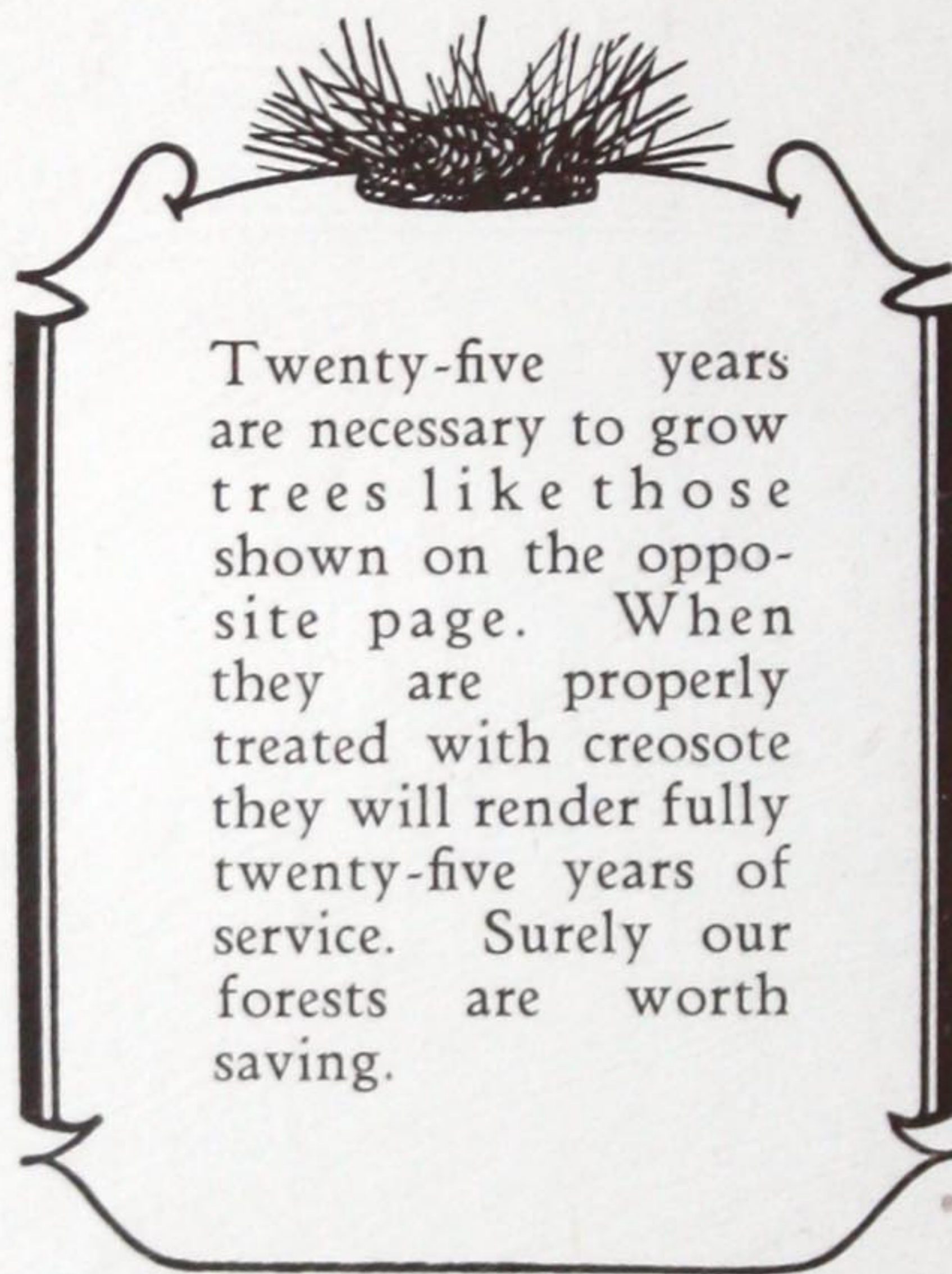
Standard requirements for specifying Creosote products as adopted by the American Wood Preservers' Association and large users of this type of material.

SOUTHERN WOOD PRESERVING CO.
ATLANTA GA.

OCT 29 '25



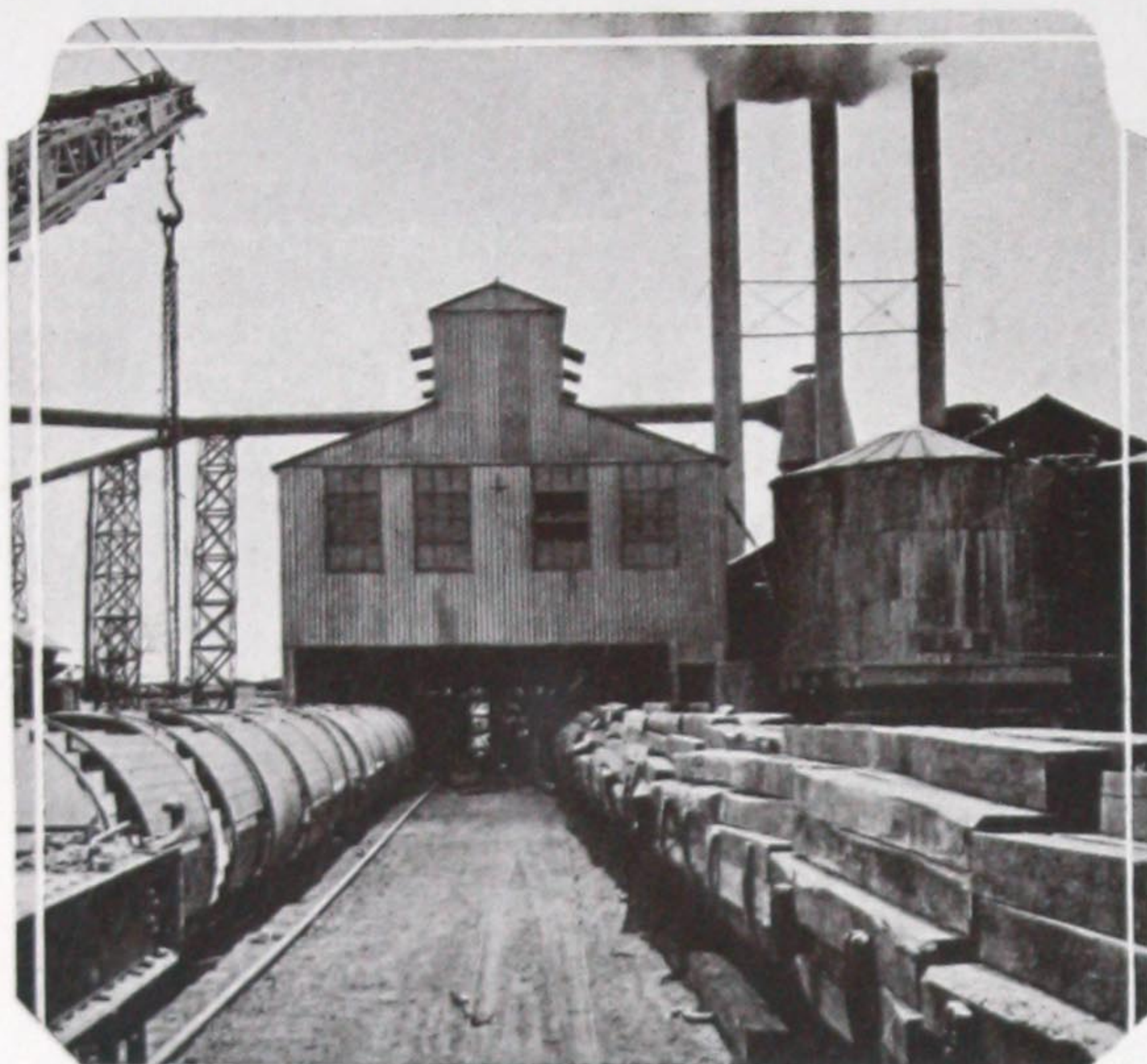
SOUTHERN WOOD PRESERVING CO.
ATLANTA, GA.



Twenty-five years
are necessary to grow
trees like those
shown on the oppo-
site page. When
they are properly
treated with creosote
they will render fully
twenty-five years of
service. Surely our
forests are worth
saving.

JD 84-13796 TCF





*Rear view of Retort house where Creosote material is carried into cylinder for treatment.
Atlanta Plant.*

The Need of Wood Preservation

In America, as in England, Holland, and other European countries, the development of wood preservation came tardily and as a distinct necessity.

Originally, wood was wasted here in a manner which by present standards seems almost criminal.

Yet even fifty years ago the waste was not very apparent, for waste is not perceived in the erection of new structures. It is only obvious when hastily built structures are wearing out, and replacement begins.

For in spite of all our building, by far the greatest quantity of wood used today is not for original structures but for replacement.

How to keep this replacement down to a minimum is not merely a matter of individual economy—it is a problem of national magnitude. Somehow, by some method, we must decrease our consumption of wood. We must conserve our forest resources. We can do this by giving every piece of structural timber the longest life that is possible to its mechanical service.

Timber, for the vast majority of mechanical uses, is not durable without antiseptic treatment. With such treatment it will last indefinitely or until mechanical conditions of its service have worn it out.

For the failures of wood, there are, in general, five large underlying causes; they are decay, insects, marine borers, mechanical abrasions, and fire. Each one of these causes may be guarded against by proper preservation. It has been estimated that the annual loss from insects boring into and destroying sound timbers is about \$100,000,000, and the



U. S. Government Department of Agriculture estimates that the efficient application of preserving methods would decrease the drain on our forest by seven billion board feet a year.

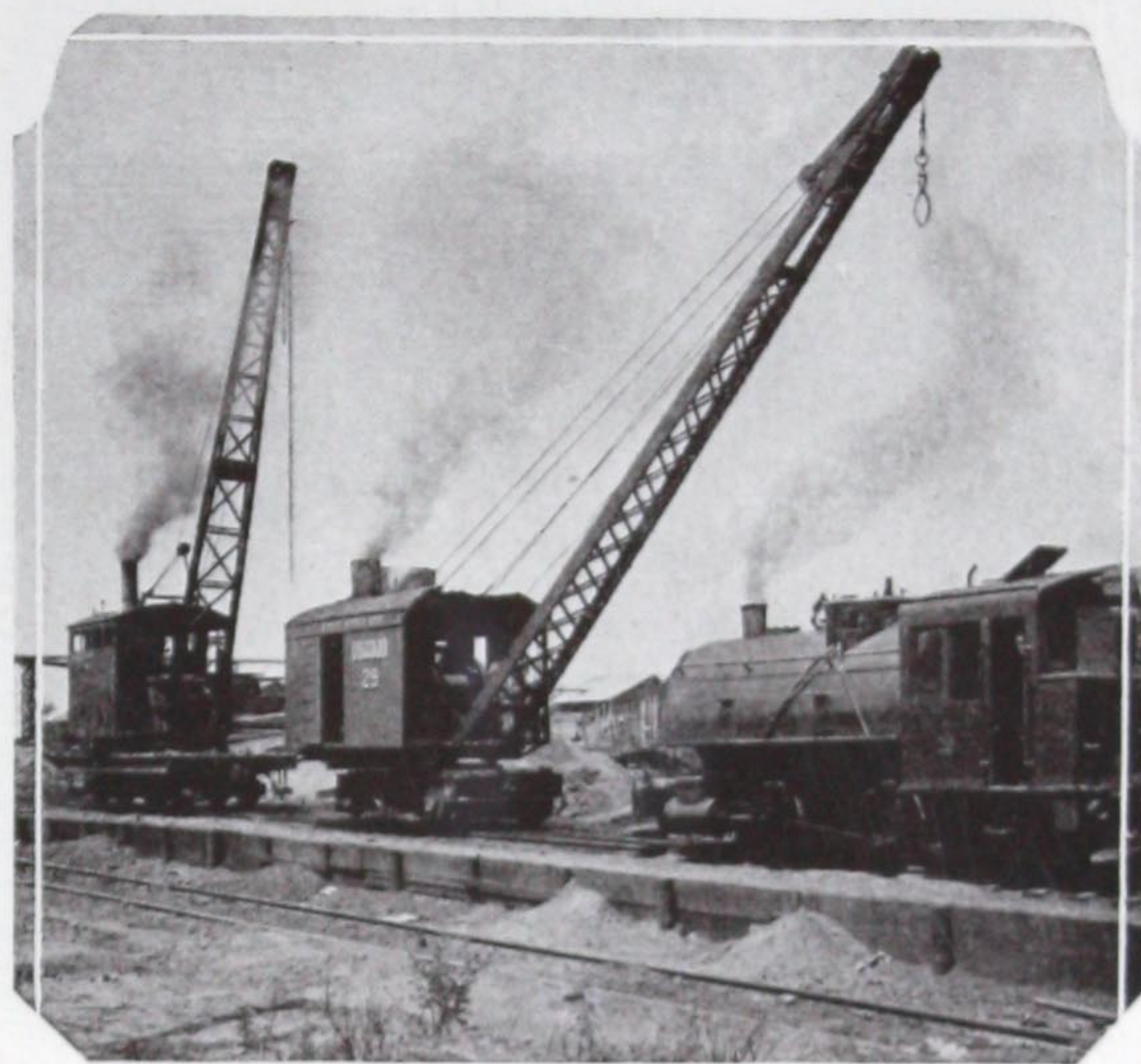
Wood Preserving Processes

Of all known methods of wood preservation, the full cell process and the empty cell process creosote treatment used in the preservation of Creo-pine products is the most effective, economical, and satisfactory.

Creosote is a by-product of coal tar, and is a very powerful anti-septic and wood preservative. It is not soluble in water, hence will not wash out of timbers sunk in water. It distills only at very high temperature, consequently it will not evaporate in timbers exposed to tropical climates. It will not flow at ordinary atmospheric temperatures, so it does not soften or leach out of the wood.

Creo-pine Full Cell Process

In the full-cell Creo-pine process, if the timber has not been properly air-seasoned, it is loaded on tram cars or "buggies" and



*Steam equipment in our Atlanta Plant.
Handling practically entirely by
machinery materially cuts down
production costs.*

drawn into a large cylinder, 6 to 8 feet in diameter and 100 feet long. The doors are closed and bolted and the wood is steamed for eight to ten hours, at a temperature not to exceed 250 degrees Fahrenheit. Then the steam is cut off, and the vacuum pumps put into operation and a vacuum of approximately 24 inches is drawn until all moisture and sap is withdrawn and the timber is thoroughly dry. Then the cylinder is filled with Creosote Oil, heated at 180 to 200 degrees Fahrenheit, and the required amount of oil forced into the wood by force pumps under 125 to 250 pounds pressure per





Timber being air-seasoned before treatment. This picture shows only a sectional view of our 36-acre Atlanta yards.

square inch, the quantity of oil being governed by the conditions under which the timber is to serve; and varying from one gallon per cubic foot to two gallons per cubic foot.

The full-cell process is used chiefly in treating Creo-pine pilings, as a means of protection against marine borers, street paving blocks, heavy bridge timbers, and conduits.

Creo-pine Empty Cell Process

The empty-cell process of creosote treatment offers many advantages over any other. It is

used chiefly in the treatment of Creo-pine wood blocks, Creopine sub-flooring for textile mills, and Creo-pine cross arms, cross ties and poles.

It differs from the full-cell process in that it is possible to obtain a very deep penetration at a small consumption of oil and leaching or bleeding of oil is practically eliminated inasmuch as all excess oil is removed.

The same type of cylindrical tank is used, but the procedure is reversed. The wood is piled into buggies and the buggies are run into the tank and the tank closed and sealed in much the same way. Then instead of drawing a vacuum, air is pumped into the tanks until the air in the wood cells is compressed. Creosote oil is then admitted into the cylinder and the pressure increased to about 150 pounds a square inch, forcing the oil deeply into the wood.

When that has been accomplished, the pressure is released; the expansion of the compressed air within the cells expels the surplus creosote from the wood, this expulsion being aided by drawing a vacuum in the tank. By this method, a very deep penetra-



tion is obtained, and at the same time no oil is wasted.

The preservation of wood by the empty-cell process, however, requires the application of more careful and skillful methods than any other. Every step in the process of preserving Creo-pine products is minutely checked and inspected. Only sound Southern yellow pine is used, free from all defects detrimental to its strength or durability.

Air-Seasoning

All timbers used in Creo-pine products, where air seasoning is necessary, are air seasoned in our own yards to a minimum of 15% moisture contents or less. This is a much more accurate and positive method of reaching a satisfactory basis than seasoning by a specified length of time where unforeseen weather conditions may greatly vary the result.

Yellow pine is the cheapest, most available, and one of the most durable of the woods which are adapted to the preservative treatment with creosote.

When scientifically treated with creosote, it outlasts more expen-



Timber for Creo-pine Blocks being air seasoned. Note the careful air spacing and stacking they receive.

sive woods; for instance, a pine cross arm untreated lives only two-thirds as long as one of fir, but treat them both and the cheaper pine lasts one-fifth longer.

Uses of Creo-pine

Creo-pine creosoted pine can be used for all structural purposes. It needs no paint or attention, no replacement or costly upkeep, and is always safe and strong.

In this book we have attempted to list the standard specifications for ordering Creo-pine products. But space prohibits us from detailing the various problems that



SOUTHERN WOOD PRESERVING CO.



*Pump room in our Atlanta Plant,
showing gauge board with accu-
rate recording instruments.
Note Creo-pine floor.*

occur in securing the proper treatment for the use in hand. Such questions can only be decided by engineers skilled in wood preserving. For this purpose we

maintain a nation-wide organization, with offices in principal cities, of Creo-pine engineers who are at your service at all times.

A letter addressed to us concerning any problem you may have will be given our best attention.

**Creo-pine*

*Creo-pine is the registered trade name of the products manufactured only by the Southern Wood Preserving Co., of Atlanta, Ga.

It means that creosoted wood so marked has passed our rigid inspection and installation service and measures up to the standard of quality we have set for "Creo-pine."



SOUTHERN WOOD PRESERVING CO.

ATLANTA, GEORGIA

Treating Plants at EAST POINT, GA. and CHATTANOOGA, TENN.

OFFICES

NEW YORK
10 East 43rd Street

PHILADELPHIA
1713 Samson Street

PITTSBURG
Dollar Savings & Trust Bldg.

BUFFALO
Erie County Bank Bldg

CLEVELAND
Hunkin-Conkey Bldg.

CHICAGO
38 South Dearborn Street

TOLEDO
Spitzer Bldg.

CHARLOTTE, N. C.
Realty Bldg.





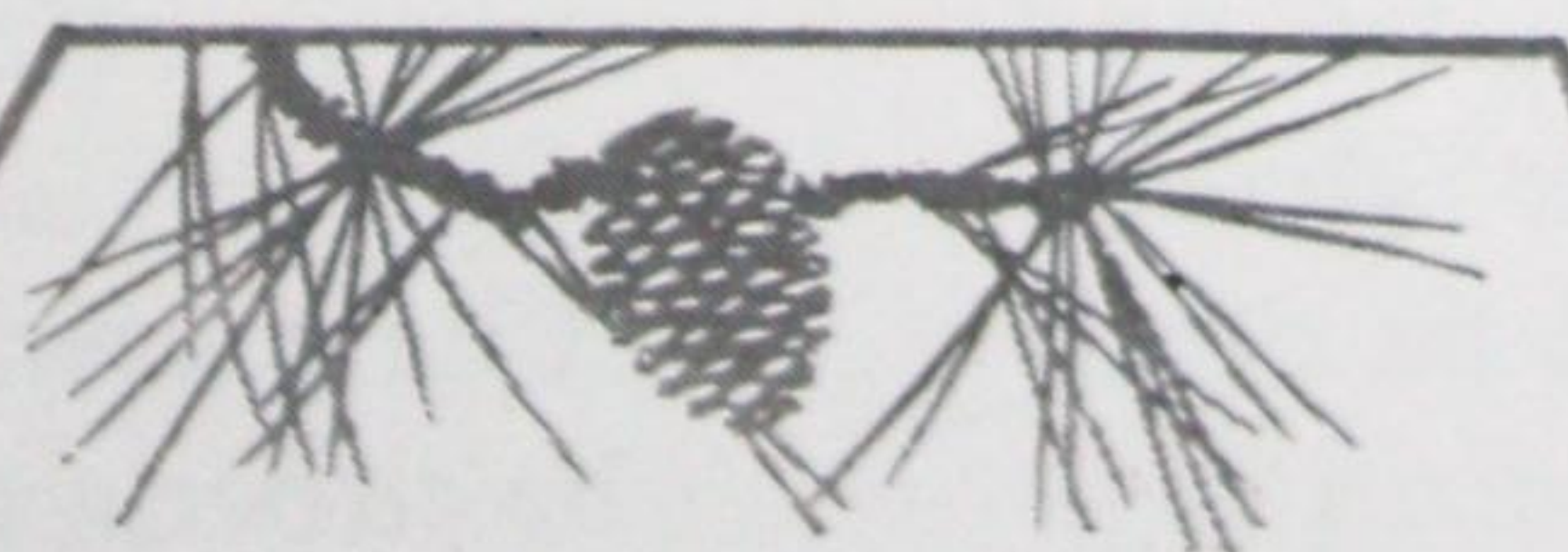
Creo-pine

Block Floors

Creo-pine Floor Blocks are milled from selected Southern yellow pine, thoroughly air seasoned to a maximum of 15% moisture content on our yards. Each block is milled to uniform size by a special machine of remarkable exactitude.

Creo-pine Wood Blocks are impregnated with pure coal tar creosote oil by the pressure-vacuum-empty-cell process in a creosoting plant especially equipped for their treatment.

Creo-pine Block Floors are today rendering economical service in such plants as the General Electric Co., Owens Bottle Co., Gulf State Steel, and Morse Chain Companies, and in the Roundhouses of Pennsylvania and Southern Railroads. Many of these installations have withstood more than twelve years of wear, are still in perfect condition and pronounced by inspecting engineers good for many more years of service. Every Creo-pine Block floor is stamped with our trade name Creo-pine.





*Creo-pine Block floors installed in plant
of Owens Bottle Company. In-
stallation supervised by
Creo-pine engineers.*

Standard Specifications

for Interior

Creosoted Wood Block Flooring

Timber

Kind

The wood from which the blocks are to be manufactured shall be air dried, dense Southern yellow pine.

Quality

The blocks must be sound and well manufactured, square butted, square edged, free from unsound or loose knots, holes, and other defects such as shakes, checks, etc., that would be detrimental to the blocks.

The number of annual rings in the 1 inch which begins 2 inches from the pith of the block, shall not be less than six, measured radially; provided, however, that blocks containing between five and six rings in this inch shall be accepted if they contain 33 1/3% or more of summerwood. In case the block does not contain the pith, the 1 inch to be used shall begin 1 inch away from the ring which is nearest to the heart of the block.

Size of Blocks

The blocks may vary in length from 5 to 8 inches, the maximum length not to exceed three times the depth; they shall be 2 to 4 inches in depth (parallel to fiber); and they may be 2 3/4 to 4 inches in width, but on any one floor all of them shall be of uniform width. A variation of 1/16 inch shall be allowed in the depth and 1/8 inch in the width of the blocks from that specified. In all cases the width shall be greater or less than the depth by at least 1/4 inch.

Preservatives

Kind

The preservative to be used may be either a coal-tar solution oil or



a coal-tar distillate oil as herein specified.

Coal-Tar Solution Oil for Floor Blocks.

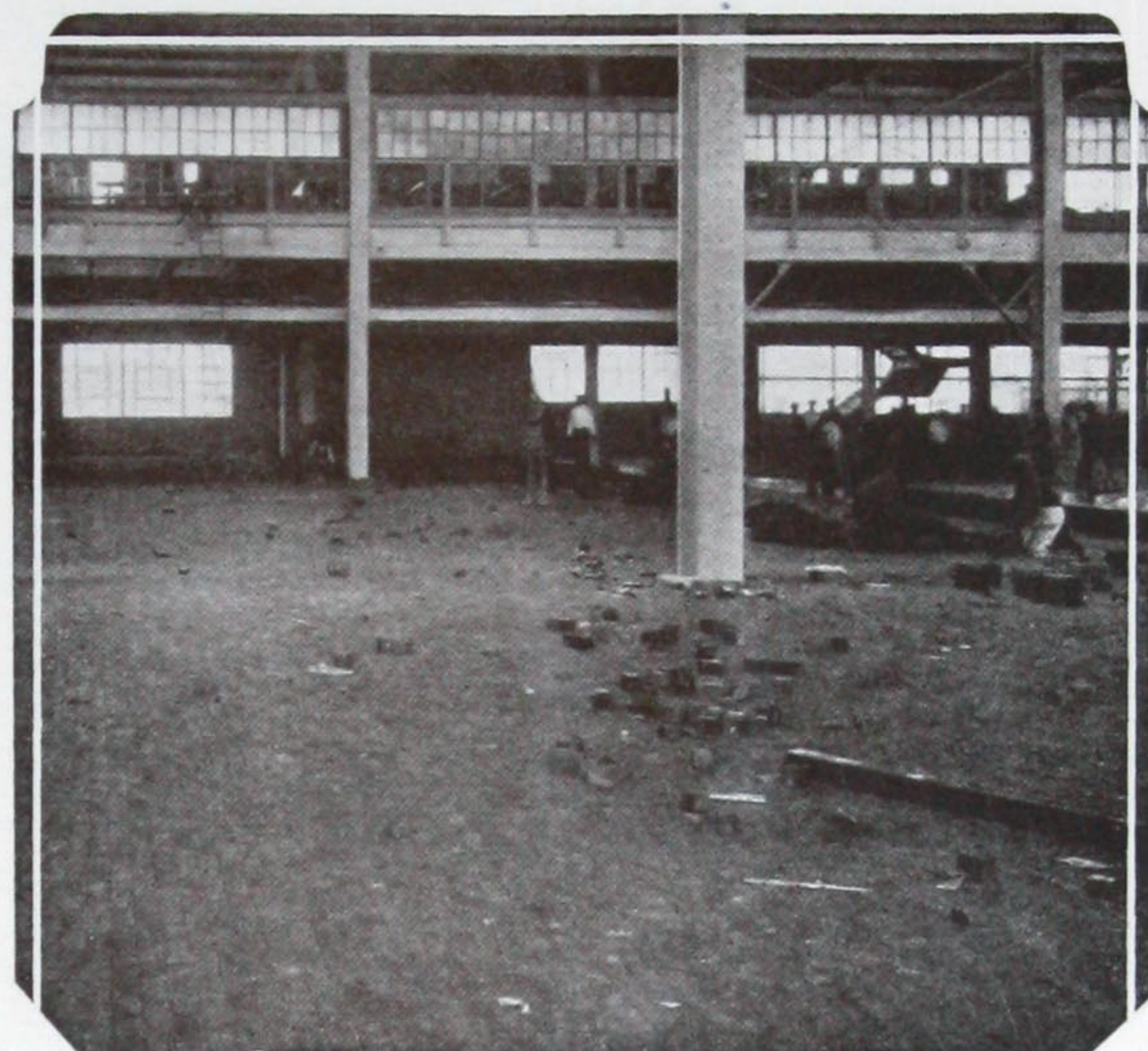
Coal Tar Distillate Oil for Floor Blocks.

Treatment

The blocks shall be treated in air-tight cylinders in accordance with any standard empty-cell process adopted by the American Wood Preservers' Association, leaving in the blocks at the end of the treatment not less than 6 lbs. of water-free creosote oil per cubic foot of wood. The gross absorption of oil injected during the process of treatment shall be sufficient to insure thorough impregnation by the preservative.

After Treatment

The blocks, after treatment, shall show satisfactory penetration of the preservative, and in all cases the oil must be diffused throughout the sapwood. To determine this at least 25 blocks shall be selected for various parts of each charge and sawn in half at right angles to the fibers through the center, and if more than one of



Section of Creo-pine block floor in the new plant of the General Electric Co. Installation supervised by Creo-pine engineers.

these blocks show untreated sapwood, the charge shall be re-treated. After re-treating, the charge shall be again subjected to a similar inspection.

The surface of the blocks after treatment shall be free from deposits of objectionable substances, and all blocks that have been materially warped, checked or otherwise injured in the process of treatment shall be rejected.

Handling Blocks After Treatment

The blocks shall be stored under cover upon arrival on the work and protected from the weather





*Section of Creo-pine Block Floor in
the plant of the Mutual Electric
Co. Installation supervised
by Creo-pine engineers.*

at all times before being laid. It is important to have the blocks as dry as possible at the time the floor is constructed. Wherever it is possible, seasoning of blocks for a period of 30 to 60 days after treatment is highly recommended.

Inspection

All material herein specified and process used in the manufacture of blocks therefrom shall be subjected to inspection, acceptance, or rejection at the plant of the manufacturer, which shall be equipped with all the necessary gauges, appliances, and facilities

to enable the inspector to satisfy himself that the requirements of the specification are fulfilled. The purchaser shall have the further right to inspect the blocks upon delivery for the purpose of rejecting any blocks that do not meet this specification, except that the plant inspection shall be final with respect to the kind of wood, rings per inch, oil, and treatment.

Sub-Grade

The sub-grade shall be thoroughly rolled, tamped, or otherwise prepared to prevent yielding after the concrete base and wood-block floor are placed.

Foundation

The foundation shall be in accordance with the general specifications of the purchaser for concrete building construction and shall be designed of sufficient strength to carry the loading to be encountered.

Bituminous Paint Coat Construction

Concrete Base

The concrete shall be finished to a smooth, even surface parallel to the contour of the finished floor level, and exactly the depth be-



low the finished level, corresponding to the depth of the block to be used. This may be accomplished by applying a mortar finish with a long-handled wooden float or similar device.

Care must be taken to see that there are no projections in the concrete that will form an uneven bearing for the blocks.

Bituminous Paint Coat

On the thoroughly cleaned and dried concrete base shall be spread a thin uniform paint coat of hot bitumen. The bitumen shall have a melting point of not less than 130 degrees F., nor more than 150 degrees F. It shall be heated to a temperature of not less than 250 F., and not more than 300 F., and mopped or flushed over the concrete, while hot, in a thin, uniform coating, the thickness not to exceed $\frac{1}{8}$ inch.

Laying the Blocks

On the hardened pitch paint coat, the blocks shall be carefully set as tightly together as possible with the fiber of the wood vertical, in straight parallel courses



*Creo-pine Block Floor installed by
Creo-pine engineers in the plant
of Casey-Hedges Co., Chat-
tanooga, Tennessee.*

with their length at right angles to the line of traffic. All joints shall be broken by a lap of at least 1 inch.

Floor Conditions

The blocks shall then be driven as tightly together as possible by ramming both in the direction of the courses and at right angles to them before the floor is rolled or surfaced.

Expansion Joints

Against the walls on all sides of the floor, as well as around all columns and other obstructions, a bituminous expansion joint





*Creo-pine Block Floor in the plant of
the Illinois Glass Co., Bridgeton,
N. J. Installation supervised
by Creo-pine engineers.*

1 inch in width shall be formed by, first, laying a strip of that width and after removal, filling the space to within an inch of the top with the same bitumen used as a filler.

Filling the Joints

After the blocks have been laid in place and brought to as true and level a surface as possible, the joints between the blocks and the space left for expansion along the walls, etc., shall be filled with a bituminous filler, applied at the highest possible temperature without burning or injuring its consistency. This filler shall be applied by flushing over the sur-

face of the floor, using a rubber-edged squeegee to force it into the joints. Care must be exercised to fill the joints uniformly and not to leave any surplus bitumen on the surface. The surface of the floor shall then be covered with sharp, fine sand which shall be permitted to remain under traffic for a week or ten days. The light film of bitumen on the surface of the blocks will wear off readily under traffic.

Durability of Creo-Pine Block Floors

Experience has proven that under severe usage the average life of other types of floors is far less than that of Creo-pine Blocks. Creo-pine Floors, installed fifteen years ago and continuously subjected to the most severe usage involved in the handling and shifting of heavy material, are today practically as good as when laid and, based upon their present condition, will render double or treble this service. These are not exceptions: they represent accurately the service and satisfaction given by each and every Creo-pine Floor during the history of this business.



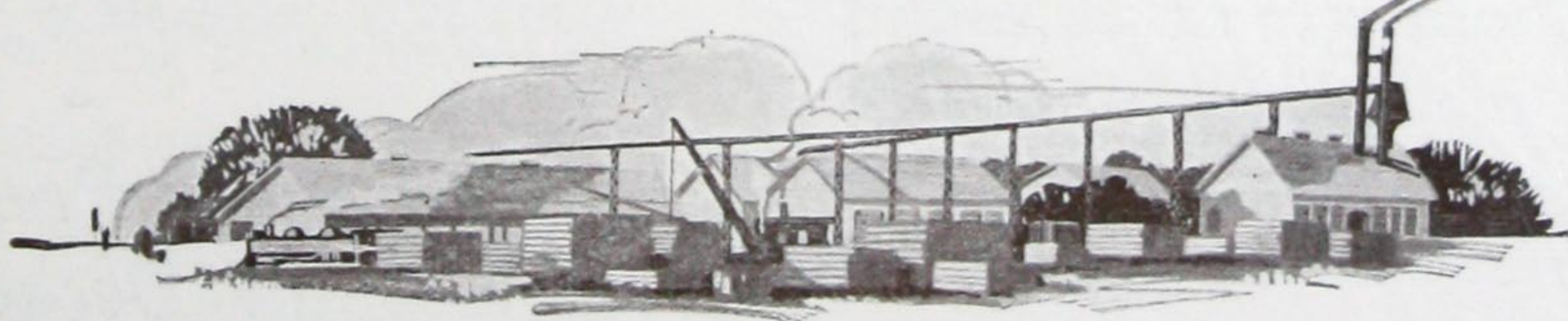
Creo-pine

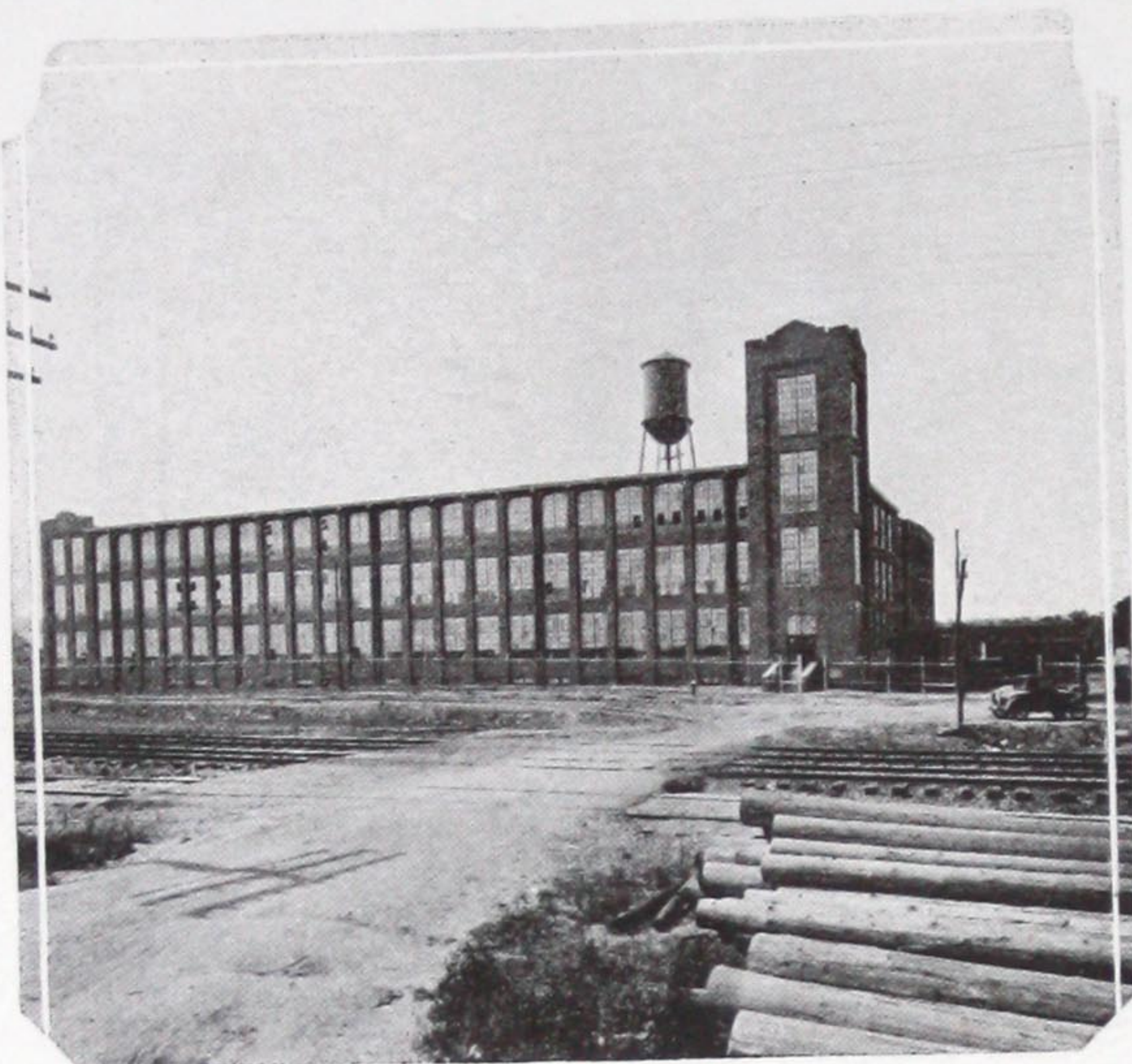
Sub Flooring for Textile Mills

Until comparatively recent years, the usual specifications for sub-flooring for cotton mills has been Long-leaf Yellow Pine, prime or merchantable grade; meaning long-leaf yellow pine in which the heart content runs from 50% to 75%.

This heart content may be expected to have long life, to resist decaying elements for a considerable number of years, but the remaining portion of each piece of lumber—the sap content—decays within a few years.

Specifying genuine Creo-pine vacuum and pressure ceosoted lumber for sub-floors in cotton mills will permit the assurance of indefinite durability. This statement, although based on Government observations and reports, is conservative as there are authentic reports of ceosoted conduits which have been under-ground for 25 years and were found, when excavated, to be in such perfect condition that they were put back for another long term of service.





*Arcadia Mills No. 2 at Spartanburg,
South Carolina, built with Creo-
pine subflooring and timbers.
They outlast the factory.*

Specifications for Subflooring for Textile Mills

Kind

The lumber shall be air dried southern yellow pine.

Quality

The subflooring must be sound and well manufactured, square butted, square edged, and free from unsound or loose knots.

The subflooring to be dressed one side and one edge.

The preservative to be used may be either a coal tar solution oil or a coal tar distillate oil.

Treatment

The subflooring shall be treated in air-tight cylinders in accordance with any standard empty-cell process adopted by the American Wood Preservers' Association, leaving in the subflooring at the end of the treatment not less than 6 lbs. of water-free creosote oil per cubic foot of wood. The gross absorption of oil injected during the process of treatment shall be sufficient to insure thorough impregnation by the preservative.

The surface of the subflooring after treatment shall be free from deposits of objectionable substances, and all subflooring that has been materially warped, or otherwise injured in the process of treatment, shall be rejected.

Note: When laying Creo-pine subflooring, where it is necessary to saw a piece in two, the new exposed ends should be painted with hot creosote.

Cause and Prevention of Decay

The chief cause of decay of lumber is fungi, which feed upon it. The process of decay once begun moves swiftly until the wood is thoroughly rotted.



Fungi thrive best in a place where the humidity or moisture content in the air is abnormally high; therefore dry rot, as it is sometimes called, attacks vigorously the underfloors of cotton mills, worsted mills and the like.

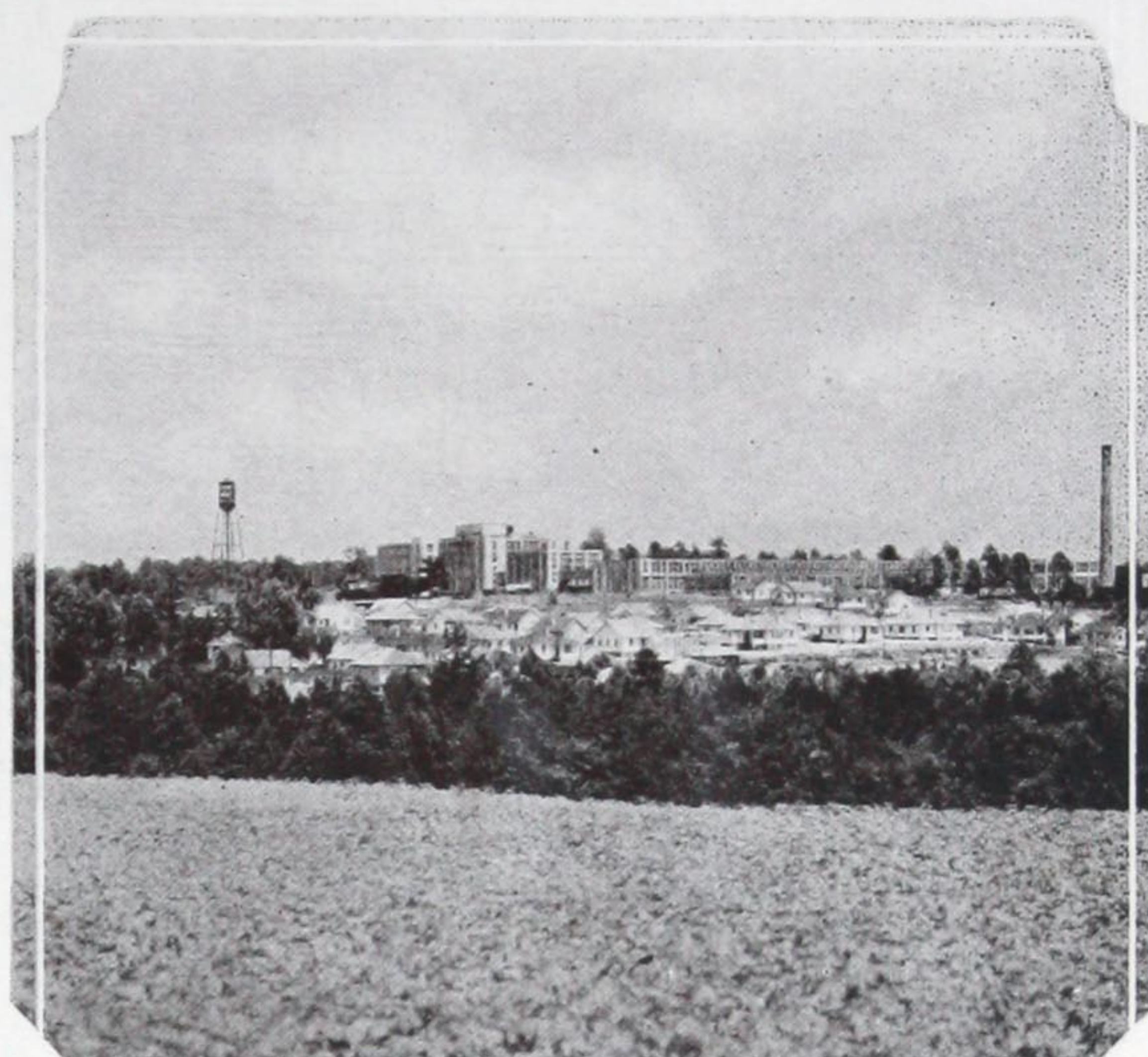
Creosote oil poisons the food which the fungi eat; therefore to prevent fungous infection or decay, the creosote must be able to penetrate the wood deep enough to form a continuous exterior shell of poisonous treated wood deeper than any surface checks which are likely to develop and to retain its toxicity or poisoning power under continuous service.

"Mill Construction"

Much of the increasing prevalence of dry rot in the past few years has been due to the installation of the slow burning type of factory floors, generally known as mill construction.

These floors are made of heavy timbers set up edgewise and spiked together. The reason they burn very slowly is because only the surface can catch fire, and they are so tightly laminated together they exclude oxygen.

This construction is slow burn-



New Pacific Mills at Lyman, South Carolina; approximately 500,000 feet of Creo-pine subflooring and timbers used in its construction.

ing because the air is excluded. When wood is injected with creosote the air is likewise excluded because the creosote has filled up all the cells of the wood: and thus the timber becomes about equally fire resistant. Wood freshly creosoted, it is true, ignites more readily than sound wood; but wood that has undergone the correct creosoted treatment for the purpose, and has been air seasoned afterwards, ignites less easily than untreated sound wood, and when finally ignited burns far more slowly.

Consequently, factory floors of Creo-pine have all of the advan-





Southern Worsted Mill, at Greenville, S. C. This mill has 190,000 feet of Creo-pine subflooring. Picture shows only a partial view.

tages of "mill construction" without the probability of dry rot occurring.

Service

The Southern Wood Preserving Company, being located in the very heart of the Southern textile district, has for the past few years specialized on subflooring for textile mills.

We have a special department for this type of material and our unusual equipment to produce it makes it possible for us to offer the highest quality subflooring at costs that make its installation especially attractive.

Users

On these pages we have pictured the types of new mills that are specifying Creo-pine subflooring. They are representative. Practically all of the larger mills being built in the South today are realizing the economy of this class of construction.

Costs

Creo-pine Subflooring is very little more costly than heart pine used heretofore. Its cost over a period of years is much lower, as Creo-pine subflooring will outlast the factory.

Economy

When Creo-pine subflooring is installed in a textile mill, it practically eliminates the necessity of shutting down machinery and curtailing production of sections of the factory to repair floors. Before specifying subflooring for textile mills, Creo-pine is well worth investigation. In our files is data which we have gathered from unbiased sources that verify its economy and durability. We will be glad to go into these thoroughly with prospective purchasers and give them the benefit of the experience of large users.



Creo-pine

Telephone, Light, Telegraph, and Power Poles

Large users of poles have long recognized the necessity of preservative treatment for this class of material.

The following table compiled by Howard F. Weiss and printed in his book, "The Preservation of Structural Timbers," is accurate.

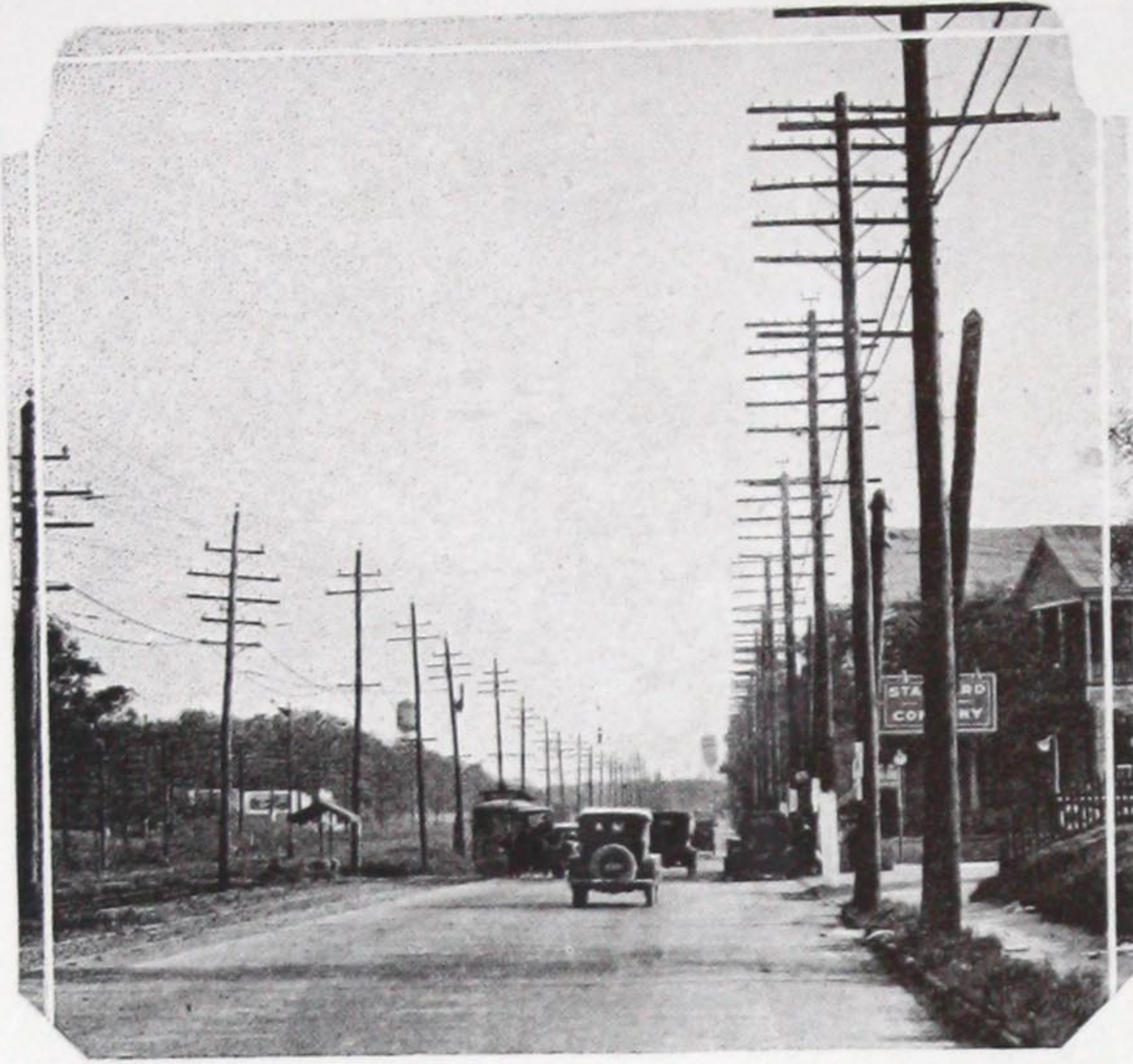
LIFE OF POLES

Untreated	14 years
Charred at Butt	15 years
Butt Brush treated	18 years
Creosote pressure process ..	30 years

Creo-pine pressure treatment of poles is absolute protection against the pole borer, the most destructive of all insects which attack exposed timbers, and the powder post insect. Southern yellow pine, properly selected and treated, makes the most durable poles to be had.

Our proximity to the source of supply, and the careful selection and inspection which Creo-pine poles undergo, make them the preferred poles of many of the largest American users.





Creosoted pine poles carrying heavy duty telephone lines. In use 18 years. Note splendid state of preservation.

Specifications for Telephone, Telegraph and Electric Light and Power Poles

All poles shall be sound southern yellow pine (long leaf, short-leaf, or loblolly pine), squared at the butt, reasonably straight, well proportioned from butt to top, peeled and with knots trimmed close. All poles shall be free from large or decayed knots. All poles shall be cut from live timber.

It is desired that all poles be well air seasoned before treatment. The poles shall not be held for

seasoning, however, up to the point where local experience shows that sapwood decay would begin. Unseasoned poles shall be treated in accordance with the requirements for treating unseasoned timber.

Preparation for Treatment

All poles shall be sufficiently free from adhering "inner bark" before treatment to permit the penetration of the oil. If the "inner bark" is not satisfactorily removed when the pole is peeled, the pole shall either be shaved, or be allowed to season until the "inner bark" cracks and tends to peel off of the surface of the pole.

The gains shall be located on the side of the pole with the greatest curvature, and on the convex side of the curve. The faces of all gains shall be parallel.

Unless otherwise ordered, all poles shall be impregnated with not less than eight (8) pounds of coal tar distillate per cubic foot of wood by the Reuping or empty cell process.

The quantity of coal tar distillate forced into the poles shall be determined by tank measurements, and by observing the

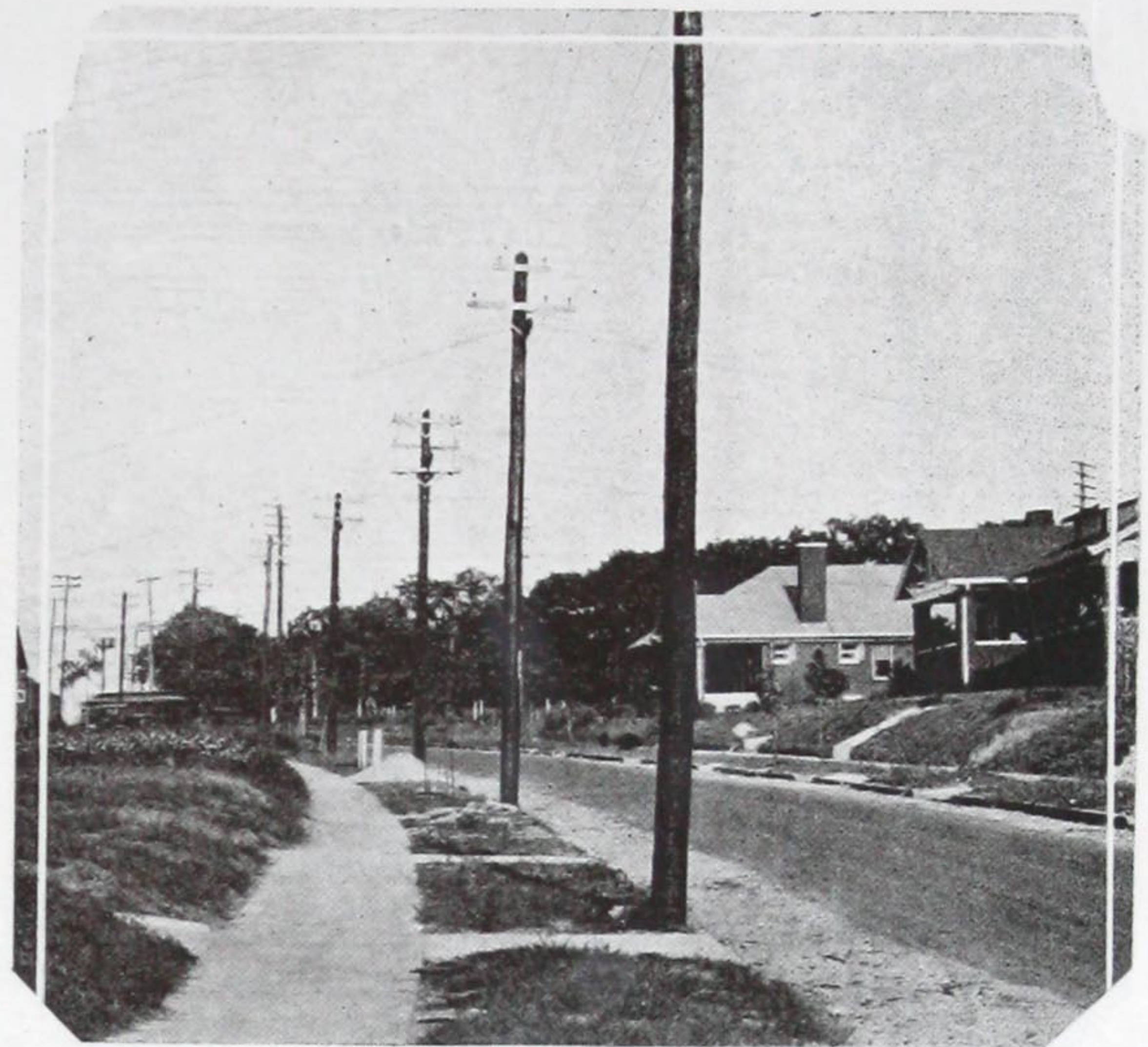


depth of penetration of the oil into the pole. In the case of poles having a growth of sapwood not less than one and one-half ($1\frac{1}{2}$) inches in thickness, the depth of penetration shall be not less than one and one-half ($1\frac{1}{2}$) inches. In the case of poles having a growth of sapwood less than one and one-half ($1\frac{1}{2}$) inches in thickness, the coal tar distillate shall penetrate through the sapwood and into the heartwood.

Test for Penetration

The depth of penetration shall be determined by boring the pole with a one (1) inch auger. The right is reserved to bore, for this purpose, two holes at random about the circumference, one hole five (5) feet from the butt and one hole ten (10) feet from the top. After inspection each bore hole shall be first filled with hot dead oil of coal tar and then with a close fitting creosoted wooden plug.

The rejection of any pole on the score of insufficient penetration shall not preclude its being retreated and again offered for inspection when correct penetration has been made.



Creo-pine light poles carrying wires for house distribution. Creo-pine poles have proven their economy for this use.

Dimensions of poles to be governed by loads to which they will be subjected.

Pine poles are naturally very straight and well proportioned and when pressure creosoted give a life of from 20 to 30 years and form a line of uniform and pleasing appearance.

Economy of Treated Poles

There are several species of wood which are used for poles in the untreated state on account of their unusual durability without treatment. However, it is only the heart of such trees that is durable and when used untreat-





Creo-pine poles carrying private telephone and telegraph lines of railroad. Creo-pine poles render unfailing service wherever used.

ed the outside sapwood will decay within a very few years, leaving ragged looking poles and poles that are rather dangerous to climb while this sapwood is decaying. The decay of this sapwood also loosens cross-arms and causes considerable expense and trouble in re-adjusting after all sapwood has decayed off.

Pine poles pressure creosoted are preserved against decay both as to sapwood and heartwood and retain their original size and symmetry throughout their life.

Better Service

Our new Chattanooga plant has been especially planned for the

treatment of poles, cross ties, and heavier timbers.

Every possible manufacturing economy has been achieved in its design. And our special facilities for obtaining highest grade raw timbers at close-range hauls and at lowest prices enables us to offer heavier Creo-pine products, and particularly poles, at costs which invariably offer substantial saving to the purchaser.

For many years Creo-pine poles have been accepted as standard by the largest American users, including the American Telephone & Telegraph Co., the Western Union Telegraph Co., the Western Electric Co., and large power plants.

Now with our new facilities, we feel that we can offer a better service than ever before, no matter how large or small the user requirements of this class of material may be.

Creo-pine Poles have been doing heavy duty service for many years, and have proven their reliability. Our engineers will be glad to confer with you on your requirements, give you details on prices, deliveries, etc.

Address the Atlanta office, and we will forward your inquiry to our nearest representative.



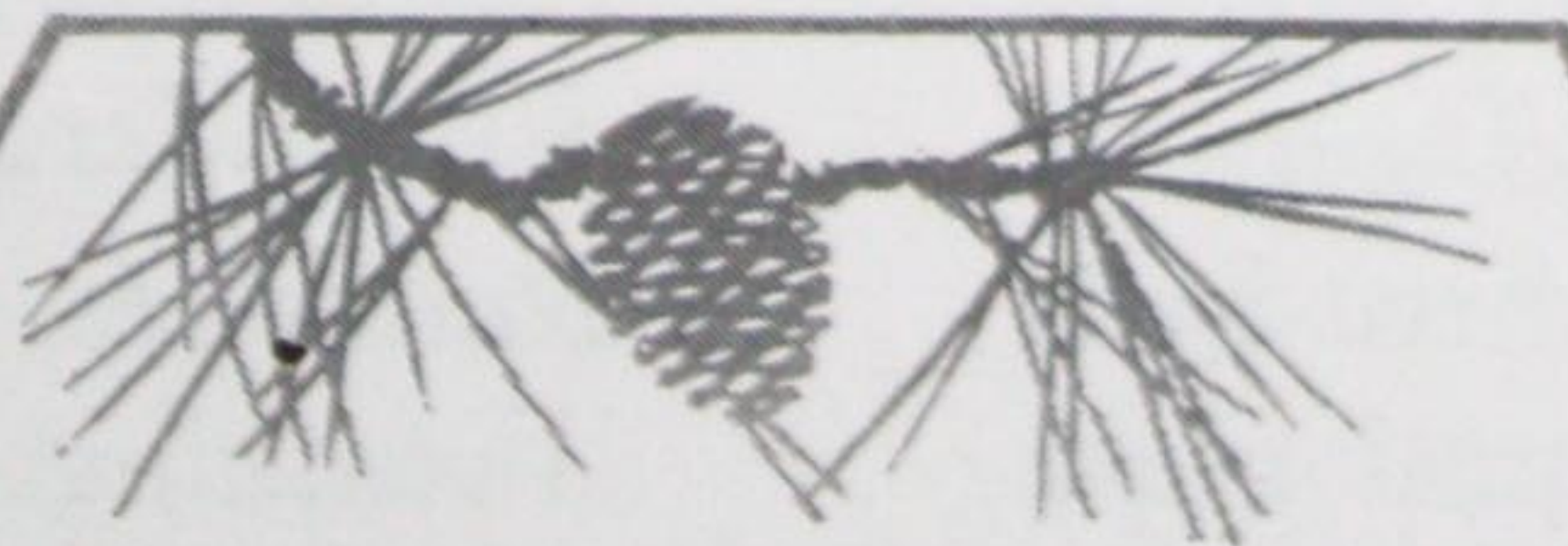


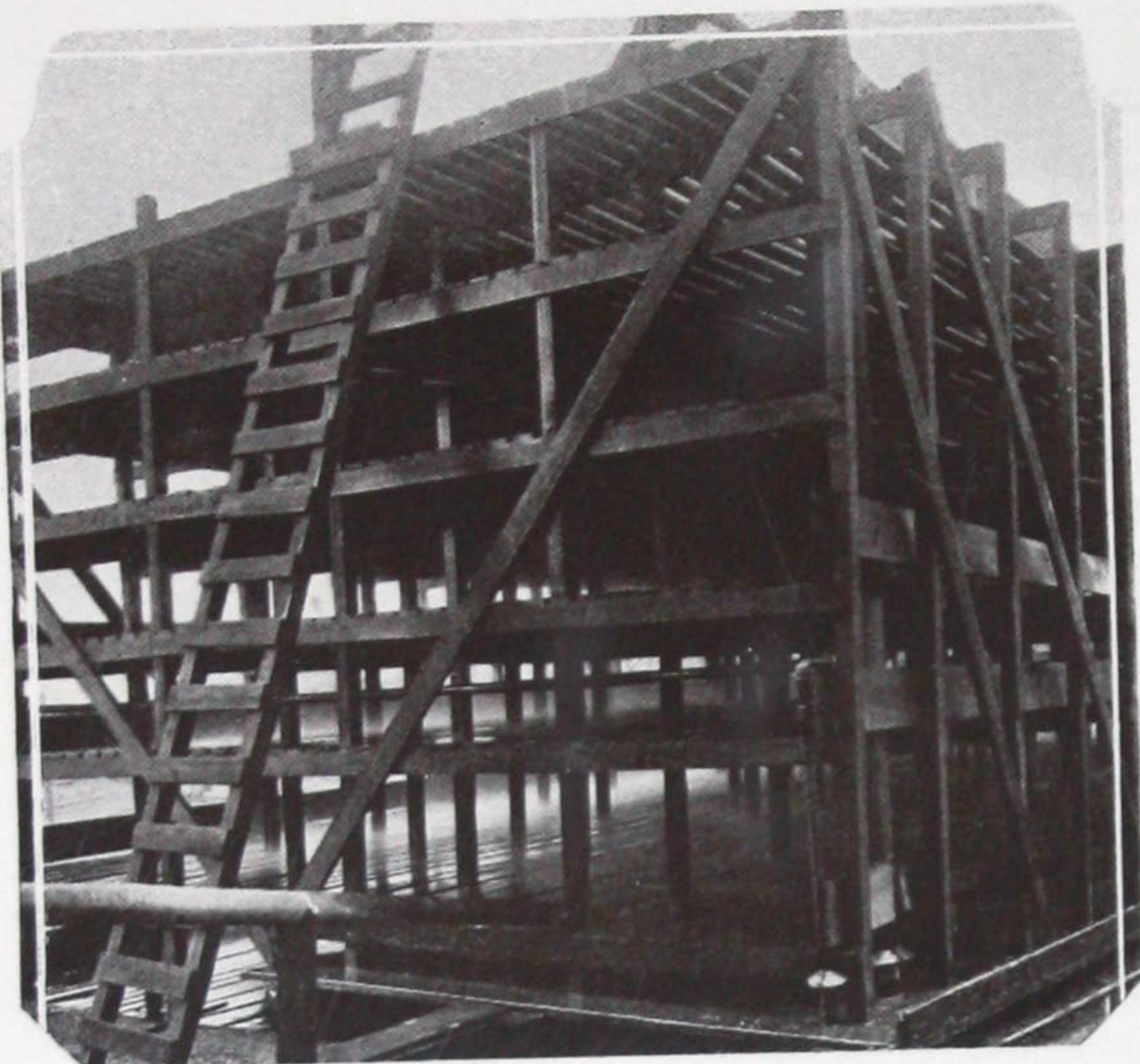
Creo-pine

Conduits—Cross Arms

Creo-pine conduit has many advantages over clay or concrete. It is more easily installed, requires no skilled labor, can be laid more rapidly, and does not require that trench be kept open. It requires no reinforcements, no special preparation, no repairs, or replacements. It is unbreakable and consequently there is no loss from this source as in clay conduits. It does not decay or rot and its life is remarkable. Creosoted conduit in Philadelphia has been in service since 1882, and is still sound.

Actual tests have proven that Creosoted Pine Cross Arms treated with creosote coal tar distillate outlast all others. Even the higher priced woods. Creo-pine cross arms have an average life of more than 30 years. They are used by the large telephone, telegraph, and power companies in great quantities.





Creo-pine water cooling tower in plant of Mountain City Mill Co., Chattanooga, Tennessee, suggested by Creo-pine engineers.

Specifications for Creo-pine Conduit and Cross-Arms

Creo-pine Conduit

Yellow Pine, 4½-inch square, with a 3-inch bore through center; mortise at one end and tenon at the other; in random lengths, 2 feet to 8 feet creosoted with *Pure Coal Tar Distillate Full Cell—Vacuum Process*.

Specifications

Made from Sound Southern Yellow Pine, and free from injurious defects that would impair its usefulness. The three-inch bore shall be smooth and clear

of jogs or off-sets, and centered through the entire length of the piece. Mortise and tenon ends shall make a snug coupling, but not so tight as to cause the conduit to split when driven together.

Treatment

After material is placed in the cylinder, if timber is not thoroughly seasoned, it shall be subjected to a steam bath of such pressure and duration as to vaporize the moisture content so that a subsequent vacuum of 24 inches will withdraw same thoroughly from the wood cells. Then creosote oil shall be applied at such pressure as will force a penetration and final retention of not less than 12 pounds per cubic foot for the entire quantity of timber treated.

Uses for Which It Is Adapted

Central Stations:

Primary circuits, distribution mains and services.

Telephone and Telegraph Companies:

Police and Fire Alarm Systems:

All underground work.

Railroads:

Trunking, signal wires, high ten-



sion transmission wires, yard drainage, either under or above ground; distribution mains and laterals.

Pneumatic Tubes: Anywhere. Creosoted wood conduit can be laid rapidly, as it comes in long lengths, is light, and is not subject to breakage. No special treatment is required for the jointing of the sections as they have a mortise on one end and a tenon on the other, fitted so snugly as to exclude sand.

Creosoted wood conduit is very flexible, and will withstand considerable movement before the joints open, and it is, therefore, a very satisfactory type of construction for use in soils that are unstable as in the case of filled ground or on hillsides.

The smooth interior surface of the creosoted wood conduit assists the installation of large cables; the wood is stiff and maintains its square tubular form, the removal of cables in cases of changes in size is easily accomplished, whereas with almost every other form of conduit old cables become fixed by the settlement of the lead sheath into any little unevennesses and sometimes are impossible to move.

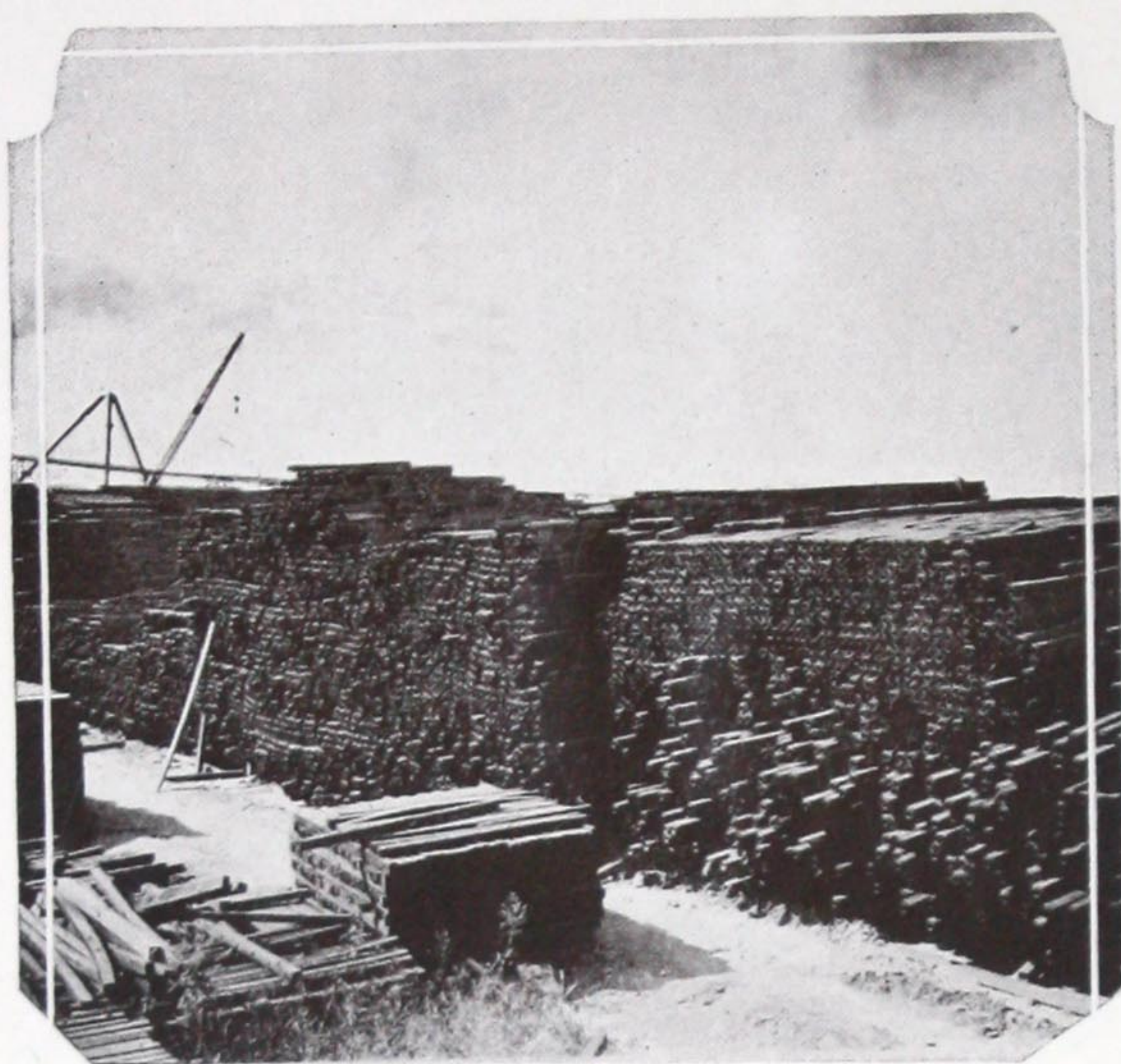


Creo-pine expansion strips for concrete roads. Creo-pine strips last as long as the road, and make the best type of construction.

Creosoted wood ducts ordinarily are laid directly upon the bottom of the trench on 1-inch creosoted wood plank, which, however, is only used for the purpose of levelling up the structure. The stack of ducts is usually protected on the top by a 1½-inch creosoted wood plank, of a width equal to that of the ducts, this being a mechanical protection pure and simple. No further operation is necessary after these ducts have been laid and the earth thrown into the trench on top of the plank.

Railroads and all other users of conduit will find creosoted wood particularly adaptable for the





*Creo-pine conduit—after treatment—
stacked in our yards for the
Spring and Summer con-
struction demands.*

handling of telephone, telegraph and signal wires through soft ground where there is seepage or heavy rainfall, as it will hold its position where other conduits sink in the soft ground.

Creo-pine Cross-Arms

Grain

All cross-arms shall be reasonably straight grained. The grain shall not depart from parallelism to any edge of the cross-arm by an amount greater than one (1) inch to three (3) feet of length of cross-arm.

All cross-arms shall be free from pitch pockets exceeding five (5) inches in length and one quarter

($\frac{1}{4}$) of an inch in width, and from all pitch pockets which enter the pin or bolt holes on the top or side of the cross-arm.

All cross-arms shall be free from loose and unsound knots and shall be free from knots at the two middle pin holes and the bolt holes. Cross-arms may have *Sound knots Not Over* three quarters ($\frac{3}{4}$) of an inch in diameter between middle bolt hole and middle pin holes, and may contain sound knots, as specified below, outside of middle pin holes. Such knots may gradually increase in size from three quarters ($\frac{3}{4}$) of an inch near the above mentioned pin holes to one half the cross-section of the arm at the end.

All cross-arms shall be free from through shakes, and from other shakes or checks exceeding three inches in length.

All cross-arms shall be free from loose hearts.

All cross-arms shall be free from rot, dote, or red heart.

Treatment

The cross-arms shall be treated by any approved empty-cell process and shall retain 8 pounds of coal tar distillate oil per cubic foot.



Creo-pine

Bridge Timbers, Pilings and Cross Ties

Creo-pine bridge timbers and pilings resist the ravages of decay and the attacks of marine borers. Their life is not yet known, but numerous cases are on record of creosoted bridge pilings and timbers that have been in use from 20 to 45 years and are still pronounced sound by engineers. Creosoted pilings taken out of the Southern Pacific Wharf at Oakland, California, were purchased by the United States Government for a new wharf.

Treatment by Creosote makes soft wood railroad ties the most efficient ties obtainable at a saving over the more costly and scarcer woods. For instance, a white oak tie untreated lasts 8 to 10 years, while a treated yellow pine tie lasts 15 to 20 years. Creosoted cross ties laid in New Orleans in 1897 were inspected in 1919 and were found to be in good condition. All Creo-pine ties are thoroughly air seasoned before treatment.





Creo-pine Cross Ties in city streets for street railways. Creo-pine Ties from our Chattanooga plant are bored and adzed.

Specifications for Bridge Timbers Piling and Cross Ties

Quality of Wood

Preservative treatment should be limited to kinds of wood which are not in themselves resistant to decay, thus making timber available which otherwise would be useless, and which is obtainable at low cost as compared with durable species.

The wood accepted for treatment should be of such a character as to be treated at least throughout the sapwood, and if the heartwood is not capable of treatment, it should be itself resistant to decay.

Only sound timber, free from defects which would reduce its value for the purposes to be used, should be treated.

Treatment will not cure decay nor defects of any kind.

Where strength is required, not only the defects which might reduce the strength but also the quality as determined by density should be specified; but where strength is not an essential, only the soundness of the timber and the sapwood requirements as determining penetrability need be considered.

- (1) Piles for use in salt water where ravages of marine are extremely severe: Specify not less than $2\frac{1}{2}$ inches of sapwood, nor more than 5 inches.
- (2) Piles for use in salt water where ravages of marine borers are less severe than in Group 1: Specify not less than 1 inch sapwood nor more than 3 inches.
- (3) Piles for use in fresh water or foundation work on land: No sapwood restrictions are necessary.

Delivery

So far as practical, arrange delivery of material so that the seasoning period may be during the seasons of minimum rainfall and humidity.

Peeling

All round timbers shall be thoroughly peeled before treatment. No piece shall be considered thoroughly peeled unless all of the rough bark and at least 80% of the inner bark shall have been removed. In no case shall any piece of inner bark be over $\frac{3}{4}$ inch



wide or over 8 inches long, and there shall be 1 inch of clean wood surface between any two such strips.

Should the strips of inner bark remaining on the pole be less than $\frac{3}{4}$ inch wide, then the clear space required between any two such strips may be proportionately less than 1 inch.

Any cross-section measured in circumference having more than 20% of its surface covered with inner bark, shall be replaced, although the entire surface of the pole may contain less than the allowable 20%.

Seasoning Before Treatment

The moisture content of the wood before treatment should be reduced, preferably by air seasoning, to not more than 20% of its oven dry weight, or to a constant weight basis. Whenever conditions will permit, thoroughly air season all structural timber, track ties, piles, and other materials before treatment.

Treatment

As service conditions vary so much, it is impossible to recommend a particular treatment for these materials without first knowing the purpose for which they are to be used.

Specifications for Cross Ties

On account of the location of our plants, we are able to offer both yellow pine and red oak cross ties.



Creosoted pine piling bridge which has carried heavy traffic for more than 20 years. Still in fine state of preservation.

General Quality: All ties to be free from any defects that may impair their strength or durability as cross ties, such as decay, large splits, large shakes, large or numerous holes or knots.

All ties shall be straight, well hewed or sawed, cut square at the ends, have bottom and top parallel and have bark entirely removed.

Ties shall be air seasoned until any moisture left in them will not prevent injection of the required amount of oil with satisfactory penetration. (To obtain these results, specify not over 20% moisture content.)

The preservative used shall be either
Creosote Coal Tar Distillate
Creosote Coal Tar Solution





Creo-pine Cross Ties in city streets for street railways. Creo-pine Ties from our Chattanooga plant are bored and adzed.

Specifications for Bridge Timbers Piling and Cross Ties

Quality of Wood

Preservative treatment should be limited to kinds of wood which are not in themselves resistant to decay, thus making timber available which otherwise would be useless, and which is obtainable at low cost as compared with durable species.

The wood accepted for treatment should be of such a character as to be treated at least throughout the sapwood, and if the heartwood is not capable of treatment, it should be itself resistant to decay.

Only sound timber, free from defects which would reduce its value for the purposes to be used, should be treated.

Treatment will not cure decay nor defects of any kind.

Where strength is required, not only the defects which might reduce the strength but also the quality as determined by density should be specified; but where strength is not an essential, only the soundness of the timber and the sapwood requirements as determining penetrability need be considered.

- (1) Piles for use in salt water where ravages of marine are extremely severe: Specify not less than $2\frac{1}{2}$ inches of sapwood, nor more than 5 inches.
- (2) Piles for use in salt water where ravages of marine borers are less severe than in Group 1: Specify not less than 1 inch sapwood nor more than 3 inches.
- (3) Piles for use in fresh water or foundation work on land: No sapwood restrictions are necessary.

Delivery

So far as practical, arrange delivery of material so that the seasoning period may be during the seasons of minimum rainfall and humidity.

Peeling

All round timbers shall be thoroughly peeled before treatment. No piece shall be considered thoroughly peeled unless all of the rough bark and at least 80% of the inner bark shall have been removed. In no case shall any piece of inner bark be over $\frac{3}{4}$ inch



wide or over 8 inches long, and there shall be 1 inch of clean wood surface between any two such strips.

Should the strips of inner bark remaining on the pole be less than $\frac{3}{4}$ inch wide, then the clear space required between any two such strips may be proportionately less than 1 inch.

Any cross-section measured in circumference having more than 20% of its surface covered with inner bark, shall be replaced, although the entire surface of the pole may contain less than the allowable 20%.

Seasoning Before Treatment

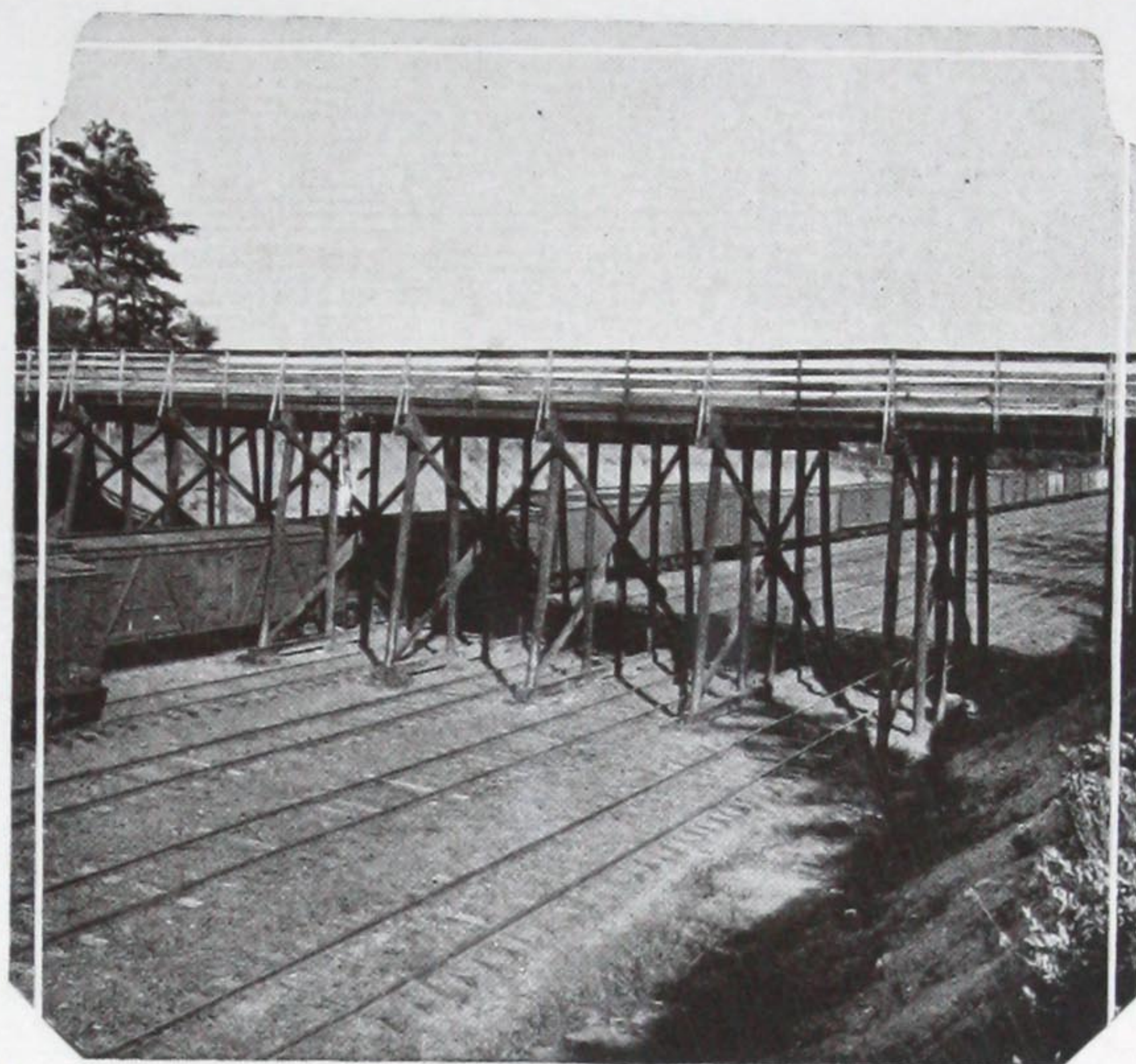
The moisture content of the wood before treatment should be reduced, preferably by air seasoning, to not more than 20% of its oven dry weight, or to a constant weight basis. Whenever conditions will permit, thoroughly air season all structural timber, track ties, piles, and other materials before treatment.

Treatment

As service conditions vary so much, it is impossible to recommend a particular treatment for these materials without first knowing the purpose for which they are to be used.

Specifications for Cross Ties

On account of the location of our plants, we are able to offer both yellow pine and red oak cross ties.



Creosoted pine piling bridge which has carried heavy traffic for more than 20 years. Still in fine state of preservation.

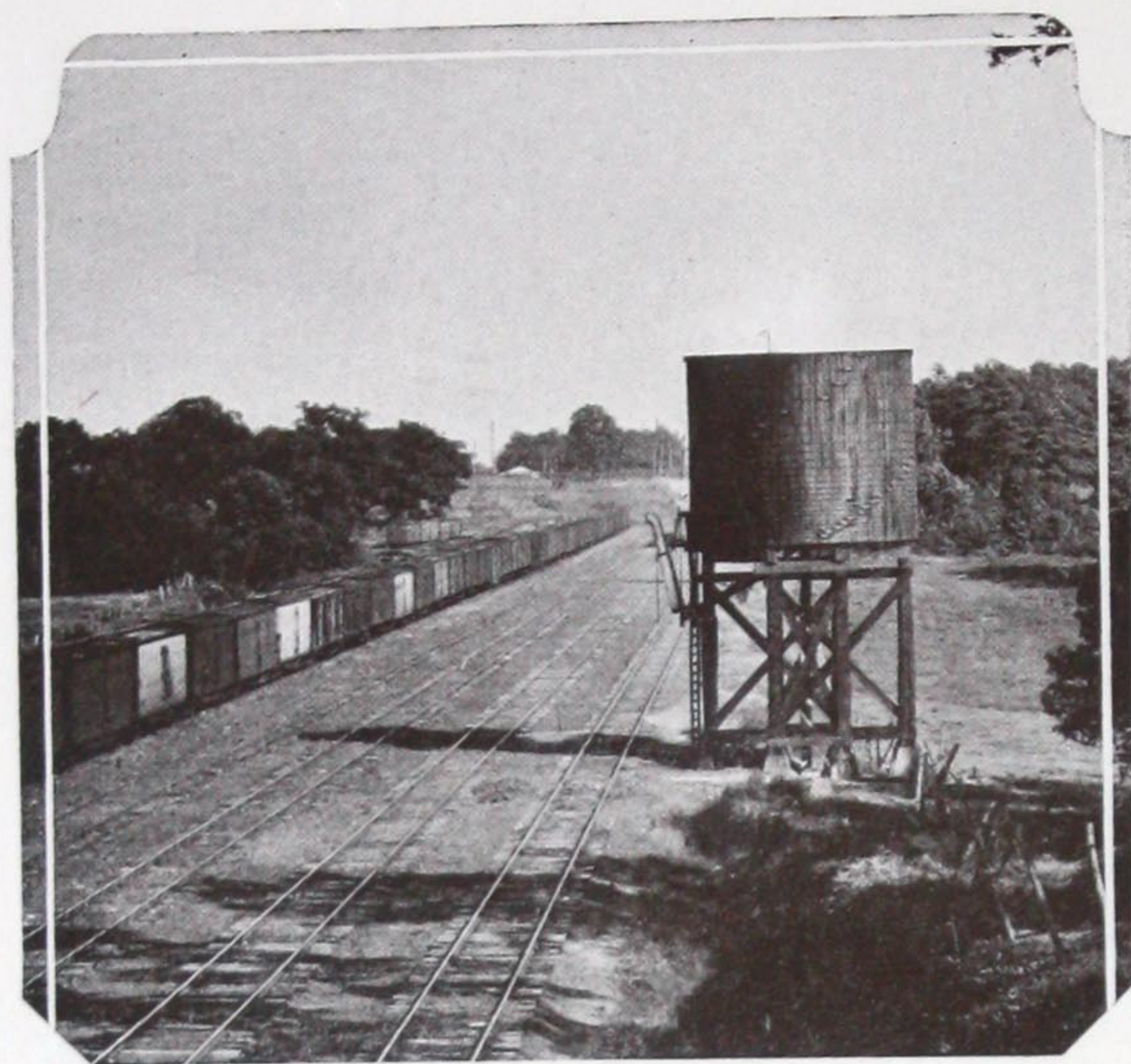
General Quality: All ties to be free from any defects that may impair their strength or durability as cross ties, such as decay, large splits, large shakes, large or numerous holes or knots.

All ties shall be straight, well hewed or sawed, cut square at the ends, have bottom and top parallel and have bark entirely removed.

Ties shall be air seasoned until any moisture left in them will not prevent injection of the required amount of oil with satisfactory penetration. (To obtain these results, specify not over 20% moisture content.)

The preservative used shall be either
Creosote Coal Tar Distillate
Creosote Coal Tar Solution





Creosoted pine water tower. Creo-pine water towers have proven very satisfactory wherever they have been used.

The ties shall be treated by the Reup-ing or Empty Cell Process and shall retain an average of 6 lbs. of creosote oil per cubic foot, which shall permeate the sapwood to a sufficient depth to thoroughly preserve against decay.

Boring and adzing cross ties should be done before treatment.

The cross ties can be bored, adzed, trimmed and branded (as to grade and size rail they are to carry) for a small additional charge, and experience has taught that this operation adds 25% to the life of the ties thereby repaying the user many times for the additional expenditure.

Some of the advantages of boring and adzing:

Machine adzing cross ties pays because perfectly parallel surfaces the

full tie width are thus formed for rail support. Every tie carries its proper portion of the load. If ties are not adzed before treatment, it is often necessary while installing to even the bearing surface of the ties with a foot adz, chopping away treated wood and often exposing untreated wood thereby shortening the life of the ties.

Machine boring of cross ties is done with not over 1/16-inch variation which insures the correct location of the spikes, makes the track gauge perfect and gives the spikes more holding power. During the treatment, the creosote oil enters the spike holes and penetrates outward preventing the exposure of any untreated wood when spikes are driven. As the spike holes are bored all the way through the ties, any water which goes down into spike holes drains on out through the bottom of the tie.

When spikes are driven into ties which have been bored and adzed, the spikes are given a firm bearing against the endgrain of the wood, whereas spikes driven into a tie not bored bend the fibers down as the spike enters and gives the spike a side bearing against the spongy bent fibers of the tie. Therefore, the possibility of rails spreading with bored and adzed cross ties is reduced to a minimum.

All cross ties are branded in the ends as to class, date of treatment and ownership. The ties are thereby correctly distributed, and each tie keeps its own service record.



The Following Oils Have Been Approved and Adopted By The American Wood Preservers' Association

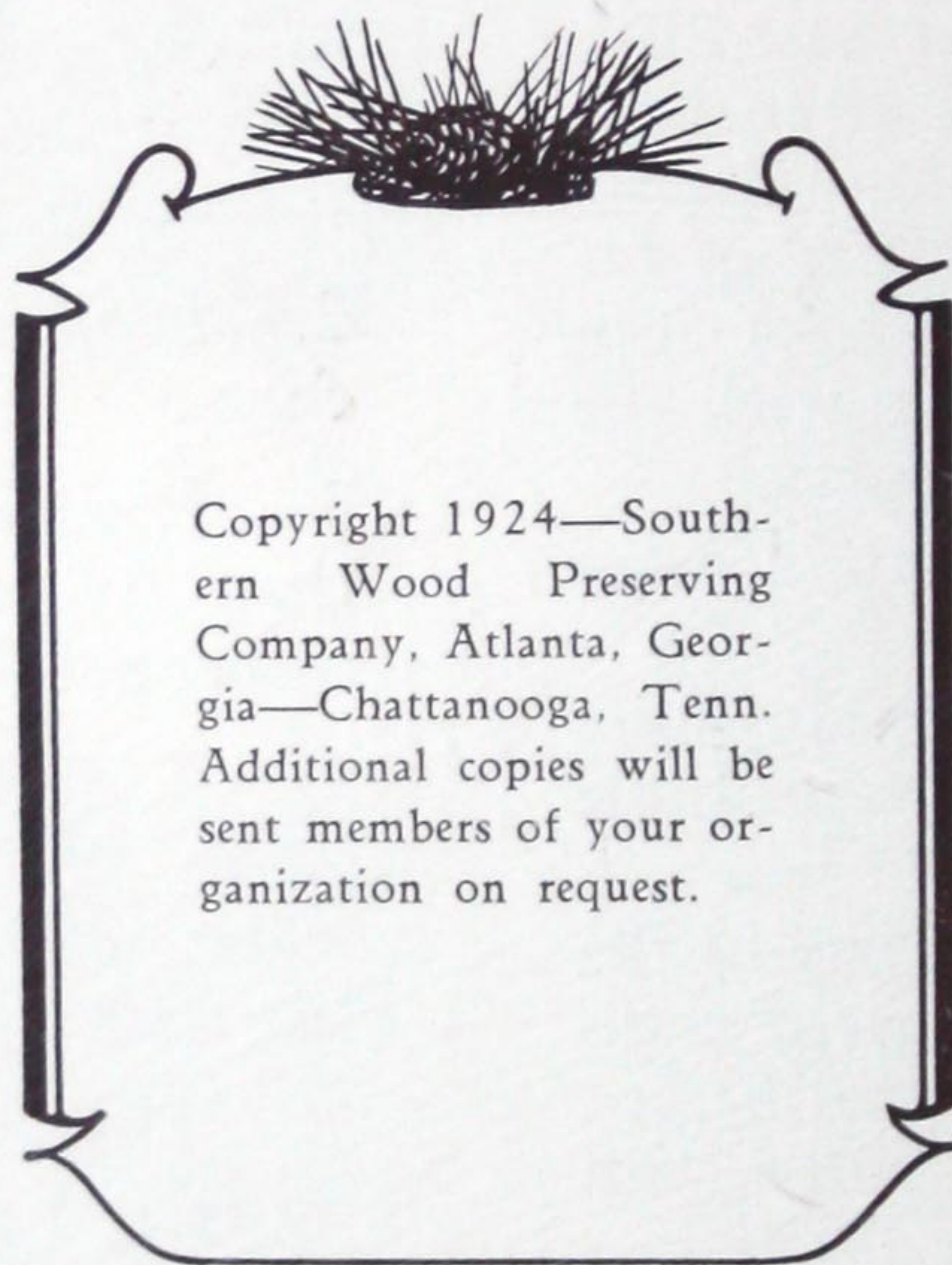
They are used in the treatment of all Creosote Products

Coal Tar Solution Oil

1. The oil shall be a coal-tar product of which at least 80% shall be a distillate of coal-tar or coke-oven tar, and the remainder shall be refined or filtered coal-gas tar or coke oven tar. It shall comply with the following requirements:
2. It shall not contain more than 3% of water.
3. It shall not contain more than 2% of matter insoluble in benzol.
4. The specific gravity of the oil at 38° C., compared with water at 15.5° C., shall be not less than 1.05 or more than 1.12.
5. The distillate, based on water-free oil, shall be within the following limits:
Up to 210° C., not more than 5%.
Up to 235° C., not more than 25%.
6. The residue above 355° C., if it exceeds 26%, shall have a float test of not more than 50 seconds at 70° C.
7. The oil shall yield not more than 6% coke residue.
8. The foregoing tests shall be made in accordance with the standard methods of the American Wood - Preservers' Association.

Coal Tar Distillate Oil

1. The oil shall be a distillate of coal-gas tar or coke-oven tar. It shall comply with the following requirements:
2. It shall not contain more than 3% of water.
3. It shall not contain more than .5% of matter insoluble in benzol.
4. The specific gravity of the oil at 38° C., compared with water at 15.5° C., shall be not less than 1.03.
5. The distillate, based on water-free oil, shall be within the following limits:
Up to 210° C., not more than 5%.
Up to 235° C., not more than 25%.
6. The residue above 355° C., if it exceeds 5%, shall have a float test of not more than 50 seconds at 70° C.
7. The oil shall yield not more than 2% of coke residue.
8. The foregoing tests shall be made in accordance with the standard methods of the American Wood - Preservers' Association.



Copyright 1924—South-
ern Wood Preserving
Company, Atlanta, Geor-
gia—Chattanooga, Tenn.
Additional copies will be
sent members of your or-
ganization on request.

